

added by this amendment. Therefore, Claims 69-71, 82-85, and 100 are at issue.

Claim 100 which recites

said entity instance table means comprises a plurality of entity instance tables" and at least one of said entity instance tables contains a first entity instance record of a first entity type and a second entity instance record of a second entity type

is supported by at least Figure 5 which shows that entity instances of both entity type CU (Customers) and entity type SU (Suppliers) are stored in entity instance table T.Companies and Figure 7 which shows two entity instance tables, T.Companies and T.Addresses.

No new matter is added by this amendment.

Rejection of Claims Under 35 U.S.C. § 103

The Examiner rejected Claims 69-71 and 82-85 "under 35 U.S.C. § 103 as being unpatentable over Shimaoka et al in view of Green."

The Examiner continues to assert that storing entities in multiple tables is disclosed in Green. Specifically, the Examiner stated that

SP 105 has two entities, which are namely S# and P#. The combined table S#P# clearly indicates a relationship of S# and P# entities. As can be seen in figures 1 and 4, S# and P# are stored in different tables. (emphasis in original)

Applicants respectfully submit that the S# and P# of Green are not entities as used in Applicant's claims. In Green, S# and P# are keys in an index to the relation tables 101 and 103.

An index is a table which relates values in one or more of a relation's columns to data base row identifiers. (DRID) which identify rows 107 of the relation in which the columns have the specified value. For example, FIG. 4 shows an S# index for relation S 101, a P# index for relation P 103, and an S#,P# relationship for SP 105. ... S# is a primary key of S, P# is a primary key of P, and S#,P# are a primary key of SP. (emphasis added)

Green, Col 7, line 60 to Col 8, line 6. Thus the S# and P# are used as an internal mechanism for optimizing queries in the

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system disclosed in Green. Therefore, the S# and P# will not be the "desired entity instance record" that is retrieved by the data base processing system of the present application.

The Examiner also stated that "Each one of the S# table and P# table is an entity instance table" in reference to Figure 1 of Green. Applicants respectfully submit that the tables shown on Figure 1 of Green are relation instance tables not entity instance tables as used in the present application. Each row of the tables in Figure 1 of Green show a relationship between the various columns of the row. For example row S1 of table 101 shows the relationship that supplier "SMITH" is located in "LONDON". Row P1 of table 103 shows the relationship that "NUTS" are stored in "LONDON." Therefore, the tables of Green Figure 1 are relation tables not entity tables.

The entities in these examples are SMITH, LONDON, NUTS, and LONDON. Since the entities are located within the relation itself, Green does not separately store the entities in entity instance tables. Therefore, Applicant respectfully submits that since Green teaches to store the entities within the relation tables, Green does not teach to use multiple entity instance tables.

Additional Arguments As Requested During Telephone Conference

During the telephone conference of April 3, 1996, the Examiner stated that the rows in the tables of figure 1 of Green are entities. Applicant's Attorneys argued that entity instances as used in the application and the claims do not encompass the rows in the tables of figure 1 of Green.

Specifically, as recited in the specification on page 31 lines 25-37, which describes figure 4A:

entity bubble, E-1 (Customer), does not itself encapsulate the attribute of possession as indicated by the apostrophe head character-string "'s". Instead, that

attribute of possession is encapsulated by the first relationship bubble, R-1. Furthermore, the second entity, E-2 (address), does not encapsulate the modifying attribute "business". Instead that attribute is also encapsulated by the relation bubble R-1. Thus, each entity bubble (E-1, E-2, E-3) is free of any narrowing attributes or modifiers and instead, represents a relatively broad and generic listing of data items which can come under the heading of either "Customer" or "Address" or "Account".

Thus in the present application, entities refer to discrete pieces of data, that do not contain relationship information.

*His 100*  
 The rows in the tables in figure 1 of Green contains multiple pieces of data. For example row S1 of table 107, contains data that there is a supplier named Smith, a city called London, a status value of 20. More importantly row S1 also gives the relationship that supplier Smith is in London with a status value of 20. Therefore, row S1 is not an "entity instance" using the terminology of the present application.

"Entity instances" as used in the present application would encompass only discrete datum within the rows in the tables of figure 1 of Green. For example, possible entity instances would include "Smith", "Jones", "London", "Paris", "Nut", "Bolt", "Red", and "Blue".

WT time - 

1	2
3	4

The following tables show one way that relationship tables 107 and 103 of Green would have to be converted to use the present invention. In the following tables, abbreviations are used for the relation names as set out below:

-SC-	Supplier's City
-SS-	Supplier's Status
-PC-	Part's City
-PR-	Part's Color
-PW-	Part's Weight

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Entity Definition Table

Slot #	Ent. Class Name	Name of Table
.1	SN	T. Supplier
.2	ST	T. Status
.3	CN	T. City
.4	PN	T. Part
.5	CR	T. Color
.6	WT	T. Weight

Relations Definition Table

Slot #	Rel. Name	Rel. Table Name	Head Ent. Type #	Tail Ent. Type #
.1	-SC-	T. Rel1	.1	.3
.2	-SS-	T. Rel2	.1	.2
.3	-PC-	T. Rel3	.4	.3
.4	-PR-	T. Rel4	.4	.5
.5	-PW-	T. Rel5	.4	.6

Entity Instance Tables

T. Supplier

Slot #	Supplier Name (SN)
.1	Smith
.2	Jones
.3	Blake
.4	Clark
.5	Adams

T. Status

Slot #	Status (ST)
.1	10
.2	20
.3	30

T. City

Slot #	City Name (CN)
.1	London
.2	Paris
.3	Athens
.4	Rome

T. Part

Slot #	Part Name (SN)
.1	Nut
.2	Bolt
.3	Screw
.4	Cam
.5	Cog

T. Color

Slot #	Color (CR)
.1	Red
.2	Green
.3	Blue

T. Weight

Slot #	Weight (WT)
.1	12
.2	14
.3	17
.4	19

Relation Instance Tables

T. REL1

SLOT #	Head Ei	Rel Type	Tail Ei
.1	SN	.1	-BC-
.2	SN	.2	-BC-
.3	SN	.3	-BC-
.4	SN	.4	-BC-
.5	SN	.5	-BC-

T. REL2

SLOT #	Head Ei	Rel Type	Tail Ei
.1	SN	.1	-SS-
.2	SN	.2	-SS-
.3	SN	.3	-SS-
.4	SN	.4	-SS-
.5	SN	.5	-SS-

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T.REL3

SLOT #	Head Ei	Rel Type	Tail Ei	
.1	PN	.1	-PC-	CN .1
.2	PN	.2	-PC-	CN .2
.3	PN	.3	-PC-	CN .4
.4	PN	.3	-PC-	CN .1
.5	PN	.4	-PC-	CN .2
.6	PN	.5	-PC-	CN .1

T.REL4

SLOT #	Head Ei	Rel Type	Tail Ei	
.1	PN	.1	-PR-	CR .1
.2	PN	.2	-PR-	CR .2
.3	PN	.3	-PR-	CR .3
.4	PN	.3	-PR-	CR .1
.5	PN	.4	-PR-	CR .3
.6	PN	.5	-PR-	CR .1

T.RELS

SLOT #	Head Ei	Rel Type	Tail Ei	
.1	PN	.1	-PW-	WT .1
.2	PN	.2	-PW-	WT .3
.3	PN	.3	-PW-	WT .3
.4	PN	.3	-PW-	WT .2
.5	PN	.4	-PW-	WT .1
.6	PN	.5	-PW-	WT .3

As shown above, the tables in Figure 1 of Green give a combination of relation instances and entity instances as defined in the present Application. Therefore, Green does not use entity instance tables as recited in the claims and does not use a an entity definition table as recited in the Claims.

The Examiner asserted that the following definition of the join operation:

A database table operation that creates a resultant entry in another table for each entry in one table whose key field matches that of an entry in the other.

suggests that "the entity instances are stored in different tables and the resultant table after the join operation relates entity types as well as entity instances."

Applicants respectfully submit that the Examiner has used impermissible hindsight to arrive at his assertion. The cited definition makes no claim that the "table" in the definition refers to entity tables as opposed to relation tables. The

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Examiner has cited no references which use multiple entity instance tables. Shimaoka teaches to use a single entity instance table to store all the entity instances. Green only teaches to use multiple relation tables which contain the entities. Applicant respectfully submits that since no references cited by the Examiner teaches multiple entity tables, the Examiner's assumption that the join operation definition refers to entity tables is obtained by impermissible hindsight reconstruction from the present application.

The Examiner further asserts that

an item code clearly suggests that entity instances may be classified under a common item code or type. One of ordinary skill in the art would be motivated to store items which belong to the same item code in a separate file in order to easily access items with the same code. Green also clearly shows separately storing different types of entities in different tables as explained above.

However, Shimaoka et al., the only reference cited by the Examiner storing entities in a separate file from relation tables, specifically teaches to use a single entity table for storing all the entities. The Examiner conceded this point by stating that "In Shimaoka et al all entities are stored in one file ..." Office Action dated April 6, 1995, page 6, line 5. As explained above, Green shows to store separate relation types in different tables not different entity types. Thus the only suggestion of multiple entity tables comes from the present application. Therefore, Applicant respectfully submits that the Examiner has used impermissible hindsight to reach his conclusions.

Since none of the Art cited by the Examiner uses multiple entity instance tables, none of the references would require an entity definition table, with entity type records which define the entity instance tables.

Claim 69 recites

(ii) entity instance table means comprised of at least one entity instance table, wherein each entity type record of said

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entity definition table is associated with an entity instance table, and wherein each entity instance table is comprised of a plurality of entity instance records wherein each entity instance record is of an entity type of said entity definition table means, ... (emphasis added)

As discussed above, using an entity definition table to define entity instance tables based on entity type records is not taught or suggested by the prior art. Therefore, Applicant respectfully submits that Claim 69 is patentable over both Shimaoka et al and Green as well as their combination. Accordingly, Applicant requests reconsideration and withdrawal of the rejection of Claim 69 under 35 U.S.C. §103.

Applicant respectfully submits that Claims 70-71, which are dependent upon Claim 69, are patentable for at least the reasons given above with regards to Claim 69.

Claim 82 recites

retrieving from entity definition table means of said relational database, based on said desired entity type and said desired record identifier, a desired entity type record wherein said desired entity type record defines said desired entity type and specifies a desired entity instance table of said relational database;

As discussed above, having a "desired entity instance table" for the "desired entity type" is not taught or suggested by the prior art. Therefore, Applicant respectfully submits that Claim 82 is patentable over both Shimaoka et al and Green as well as their combination. Accordingly, Applicant requests reconsideration and withdrawal of the rejection of Claim 82 under 35 U.S.C. §103.

Applicant respectfully submits that Claims 83-85, which are dependent upon Claim 82, are patentable for at least the reasons given above with regards to Claim 82.

New Claim 100

Applicant respectfully submits that Claim 100, which is dependent upon claim 69, is patentable for at least the reasons given above with regards to Claim 69. Furthermore, Applicant respectfully submits that Claim 100 is patentable in its own

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right since Claim 100 recites

wherein said entity instance table means comprises a plurality of entity instance tables and at least one of said entity instance tables contains a first entity instance record of a first entity type and a second entity instance record of a second entity type.

As explained above, none of the references cited by the Examiner uses "a plurality of entity instance tables" as recited by Claim 100. Furthermore, even if the S# and P# of Green were entities with entity types, Green does not teach or suggest placing two entity types in the same entity instance table. It is, therefore, respectfully submitted that Claim 100 is patentable.

CONCLUSION

In view of the above amendments and remarks, it is respectfully submitted that Claims 69-71, 82-85, and 100 are in condition for allowance and a Notice of Allowance is respectfully requested. If the Examiner contemplates action other than allowance of all the pending claims, the Examiner is requested to call Applicants' attorney below at (408) 453-9200.

Respectfully submitted,

  
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